ABSTRACT OF THE DISCLOSURE

A turbine valve control system is provided. The turbine valve control system includes a variable flow metering device, a first sensor, a second sensor, a third sensor, a fourth sensor, memory, and processing circuitry. The variable flow metering device is capable of meeting a plurality of predetermined mass flow rates by varying positioning of the flow metering device. The first sensor is configured for detecting variable positioning of the flow metering device and generating a first output signal that is a function of the positioning of the flow metering device. The second sensor is configured for detecting fluid pressure upstream of the flow metering device and generating a second output signal that is a function of the detected upstream fluid pressure. The third sensor is configured for detecting fluid pressure downstream of the flow metering device and generating a third output signal that is a function of the detected downstream fluid pressure. The fourth sensor is configured for detecting temperature upstream of the flow metering device and generating a fourth output signal that is a function of the detected temperature. The memory includes first computer program code for calculating a combined coefficient of discharge times area that gives a desired flow for a given valve position, upstream pressure, downstream pressure, and temperature for subsonic flow. The memory also includes second computer program code for calculating a combined coefficient of discharge times area that gives a desired flow for a given valve position, upstream pressure, and temperature for sonic flow. The processing circuitry is configured to receive the signals, determine whether the flow is subsonic or sonic, and implement a corresponding one of the first and second computer program codes to calculate a combined coefficient of discharge times area that will

generate a desired mass flow rate for the flow metering device. A method is also provided.